

FORESTRY 101

Monitoring Your Woodlands

Part 2

by Doug McLaren

Believe it or not, your woodlands are constantly changing—new trees are sprouting, and established trees are actively growing in height and diameter or are declining due to lack of sunlight, drought, insect/disease infestation, or simply old age. Your forester will usually make a periodic visit to your woodlands every five to 10 years and during these visits will make note of these slowly evolving changes.

Most woodland landowners will do at least a partial “walk-through” on these periodic visits with their forester; acknowledging any changes that may have occurred in the landowners long and short-term objectives and goals for their woodland. It is evident to most landowners that a forester never stops and looks at every tree in the woodlands during these visits but still collects necessary information to make an estimation of the number of trees, their volume, and the overall health of the woodland. The question that many landowners ask about is how are these measurements for volume per acre determined by the forester? Simple—sampling! It is the same process that you utilize when you determine whether that pot of soup you are preparing needs more salt. You do not need to taste the entire pot to make this determination. You simply sample a “small portion of the whole.” It’s the same for forest measurements—you just measure a sample of the trees on any one unique site to represent that area.

The next question asked by the woodland owner is, “How many trees have to be sampled to represent that unique stand of trees in my woodlands?” The answer is based on the economics of time and

the accuracy required. The fewer trees we measure, the better, but enough are needed to give a true representation of the stand. Again, let’s use the soup pot example. Most of us will utilize a teaspoon or tablespoon to do our sampling. We could use a cup, but you can readily understand that type of measurement would be too much (unless the soup is really good). So, a teaspoon or two will do the job for soup. How does this concept relate to the number of trees needed to estimate our woodland volumes?

Many foresters will establish a circular plot or use a prism—a small piece of angled glass—to gather the information. For the landowner, this is pure forestry techno “magic.” For woodland owners, there is a method that can provide very adequate volume results and it is referred to as the 1/10-acre plot. There are other sized plots that could be utilized, but the 1/10-acre plot makes tree volume estimations of an acre easy for landowners. A circle that is 37.2 feet in radius will provide a plot that represents 1/10 acre.

If you are comfortable measuring heights and diameters of trees, you are one step closer to estimating volumes of timber. Locate a random spot in your woodlands to estimate the volume of that particular area. You will need to take a tape measure and mark off the radius of 37.2 feet from a center point. Then measure the

Photo courtesy: Kentucky Division of Forestry



Woodland owners should make a point of accompanying their forester when they visit their property if at all possible. These visits are an invaluable opportunity to discuss and exchange information about your woodlands.

Conducting a Simple Timber Inventory



This publication provides an introduction to the terminology and methodology of conducting a timber inventory and should allow you to communicate effectively with forestry professionals regarding your timber inventory. It is available at <https://utextension.tennessee.edu/publications/Documents/PB1780.pdf>

TREE SCALE STICK DOYLE RULE (FC-78)		DIAMETER OF TREE (INCHES)																	
HOLD STICK LEVEL 25 INCHES FROM EYE AGAINST TREE AT HEIGHT OF 4 1/2 FEET, READ AVERAGE TREE VOLUME IN BOARD FEET		10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25		
1	16 FOOT LOG	14	22	29	38	48	60	72	86	100	118	135	154	174	195	216	241		
2	16 FOOT LOGS	20	32	43	59	75	96	116	140	164	194	225	260	295	332	370	414		
3	16 FOOT LOGS	22	38	53	73	93	121	149	182	215	256	297	344	392	444	496	558		
4	16 FOOT LOGS			56	80	103	136	170	209	248	297	346	404	462	522	582	660		
5	16 FOOT LOGS											383	452	521	594	668	758		

Photo courtesy: Steve Patton

determined the diameter of the tree and the number of 16-foot merchantable logs it contains you can readily determine the volume. For example, using the tree scale stick shown, a tree with an 18 inch diameter that has 1 16-foot log contains an estimated 100 board feet. These sticks are available from Forestry Suppliers (www.forestry-suppliers.com) for less than \$15.

The Tree Scale Stick is a valuable tool that can be used to measure tree diameter and tree height. It also contains a tree volume table that will give you an estimate of the number of board feet in your trees. Once you have

diameter and log height of all the trees that are 10 inches in diameter at 4½ feet from the ground (also known as diameter at breast height, or DBH) within this circle. One question that normally comes up during this process is about trees that are “on the line.” For our example it will be acceptable to measure every other tree that is deemed “on the line.” Locate a volume table and determine the volume of all the trees measured. Since this is a 1/10-acre plot, simply multiply the total volume for the plot times 10 to obtain the estimated volume for this area on a per acre basis.

Now we need to discuss the number and locations of the samples that should be taken. Remember that pot of soup still cooking on the stove? Suppose that in addition to the pot of soup you have a pot of chili cooking too—you cannot get an estimate of the salt needs of the chili by sampling the soup; you will have to sample the chili separately. The same applies to estimating volume within your woodlands. Several samples should be taken within any one unique growing site because of the variation we find in Kentucky’s woodlands. For example, say you have an old field site that has established itself in yellow-poplar. You would take several samples within this site to determine the average estimated volume of the site. In the eastern part of the state, we normally have less desirable growing conditions along the ridgetops. Such an area would be another section where you would take several samples and list this average. Separating older more mature timber from younger stands would be another delineation of sampling sites. Consult the woodland management plan that was developed by your forester for the locations of the specific sites that have been identified in your woodlands.

After you have sampled all the different wooded sites that exist in your woodlands, you will have a very rough estimate of the total timber volume in your woodlands. Share this information with your visiting forester and ask for feedback and suggestions on your initial steps on monitoring your woodlands.

Kentucky forests have a tremendous amount of diversity and variation largely because of our geographic location and wide range of topography. Conceptually breaking your property down into units (or “stands”) based on similarities such as landscape position, land use history, species composition, management objectives, etc. and sampling these units separately will allow you to have more accurate information that can enhance the management of your woodlands.



Photo courtesy: John Cox

About the Author:

Doug McLaren is an Area Cooperative Extension Specialist with the University of Kentucky Department of Forestry.

Cooperative Extension Service, Department of Forestry, University of Kentucky, 107 Thomas Poe Cooper Building, Lexington, KY 40546-0073; Phone: 859.257.2703; Fax: 859.323.1031; E-mail: dmclaren@uky.edu